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Technical Memorandum

To: Kevin Parrett, Project Manager-- McCormick and Baxter Superfund Site

Date: May 6, 2004

From: John Montgomery

Subject: April 1, 2004 through April 29, 2004 Barrier Wall Performance Monitoring Monthly Report

1.0 Introduction

This technical memorandum presents a monthly status report on groundwater movement and nonaqueous phase liquid (NAPL) thickness results inside and outside the barrier wall at the McCormick and Baxter Creosoting Company, Portland Plant (McCormick and Baxter) site in Portland, Oregon. The technical memorandum presents hydraulic head measurements and gradients, groundwater contour maps, transducer plots, NAPL gauging and extraction results. The monitoring data was collected during the period from April 1, 2004 through April 29, 2004. Figures, tables and transducer plots are attached at the end of this technical memorandum.

The monitoring system at the McCormick and Baxter site is used to evaluate the functional performance of the containment system (the barrier wall) and to determine whether the containment system is performing the designed function. The purpose of this report is to provide data in support of the objectives and goals as defined in the monitoring plan. These include:

- Understand changes in groundwater flow outside and inside the barrier containment system;
- Understand changes in gradients/fluxes from the bluff to the river on the north and south sides of the containment system;
- Understand groundwater flow and contaminant movement along the riverfront downgradient of the containment system;

- Determine the effects of groundwater flow toward Willamette Cove in relation to existing NAPL seeps; and

- Determine the effects of river stage and tidal influence on groundwater levels and flow.

2.0 Water-Level Monitoring

Automated Water-Level Data Collection

Groundwater level data is currently being collected at the site from select monitoring wells using automated pressure transducers and manually operated electronic water-level indicators.

Approximately 55 monitoring wells were monitored during the reporting period to determine groundwater elevations and calculate gradients inside and outside the barrier wall. Twenty-four select monitoring wells are equipped with pressure transducers to collect water-level measurements at hourly intervals (Table 1). The pressure transducers are equipped with internal batteries to allow for in-situ placement in the well. Data is currently downloaded at monthly intervals for each transducer location using a hand-held personal digital assistant or PDA. Groundwater-level data were collected manually from the remainder of the monitoring wells on a bi-weekly basis during the reporting period.

The monitoring wells designated with an *s* (e.g., MW-36s) are wells screened in the shallow zone. Those wells designated with an *i* (e.g., MW-36i) are screened in the intermediate zone, and those wells designated with a *d* (e.g., MW-36d) are screened in the deep zone. All deep zone monitoring wells were screened beneath the total barrier wall depth in that location. Figure 1 shows the locations of the monitoring well network.

River stage data is recorded daily from the Morrison Bridge and corrected to river stage adjacent to the McCormick and Baxter site.

2.1 Groundwater Flow and Gradients

Water levels recorded inside the wall have historically been higher relative to water levels outside the barrier wall in well clusters located along the riverfront. Figure 2 presents a groundwater contour map from the previous monitoring event, dated March 29 and 30, 2004. This trend continued during the current monitoring event. Figure 3 presents a groundwater contour map for April 27, 2004. Groundwater inside the wall continues to flow toward the FWDA. Calculated horizontal gradients for the current monitoring event are 0.004 ft/ft from MW-50s to MW-36s. The upland portion of the site shows groundwater mounding behind the barrier wall with locally reversed gradients toward the bluff. Groundwater outside the wall is diverted around the upland portion of the wall toward Willamette Cove and toward the southeastern portion of the site. In the FWDA, heads inside the wall were approximately 4.85 feet higher than heads outside the wall. In the TFA, heads inside the wall were approximately 8.04 feet higher than heads outside the wall.

Based on groundwater contour anomalies observed during previous reporting periods, several of the site wells were re-surveyed to verify measuring point elevations. A total of 27 wells were re-surveyed in April 2004. Elevation changes at these wells ranged from less than 1 foot to over five feet. Corrected elevations at these wells generally eliminated previously observed groundwater contour anomalies.

Vertical groundwater gradients were calculated using data from April 26, 2004 for several of the nested wells installed inside and outside the barrier wall. Table 2 presents the calculated vertical gradients between the shallow, intermediate and deep aquifer zones during both rising and ebb tides. Vertical gradients are generally down inside and outside of the wall in the both the FWDA (wells 36, 37, 40, 41) and the TFA (44 and 45). The effect of rising versus ebb tide is not immediately apparent and the effect of lag time is being further evaluated.

2.2 Transducer Plots

Transducer plots were developed for select monitoring wells (MW-36s, MW-37s, MW-44s and MW-45s) inside and outside the barrier wall during the reporting period and are included as an attachment following the tables. The shallow aquifer plots compare monthly water-level elevations inside the barrier wall versus water-level elevations outside the barrier wall, river elevation, and precipitation data. Water levels outside the wall correlate well with river stage along the riverfront portion of the barrier wall. Water levels in shallow wells inside the wall showed a decrease in elevation in wells located in the FWDA and water levels appeared to level off in wells located in the TFA during the reporting period. Precipitation decreased during the reporting period. Water levels in the TFA previously indicated that groundwater mounding is occurring inside the wall, during this reporting period however we see water elevations leveling off and a slight decrease occurring. This is likely due to the decrease in precipitation.

3.0 NAPL Thickness and Extraction

Light non-aqueous phase liquid (LNAPL) and dense non-aqueous liquid (DNAPL) measurements were recorded at several site wells during the reporting period. Currently, twenty-eight monitoring wells in the TFA and the FWDA are measured for NAPL thickness on a weekly basis. When LNAPL exceeding 0.5 ft thickness is encountered during routine monitoring, it is manually extracted using passive skimmers or bailers. When DNAPL exceeding 1.0 ft thickness is encountered during monitoring it is extracted using pneumatic pumps. E & E is continuing to evaluate methods for extracting DNAPL of lesser thickness, but historically this has been problematic. Increased frequency of NAPL measurements and extraction during the monitoring period however, appear to have increased the overall removal volume. Table 3 presents LNAPL and DNAPL thickness measured during April 2004 and the amounts of NAPL extracted at each well following the measurement. Clean wells (wells not containing NAPL) are gauged bi-weekly for water levels and total depths, and to verify that NAPL has not infiltrated these wells. Figures 2 and 3 show the locations of monitoring wells that have exhibited measurable thicknesses of LNAPL and/or DNAPL during March and April, respectively.

LNAPL

The measured LNAPL thicknesses ranged from 0.03 feet in MW-Is to 5.22 feet in EW-15s. Six wells in the FWDA and four wells in the TFA exhibited measurable thicknesses of LNAPL during this reporting period (Table 3). This is a decrease in distribution from the previous reporting period (from 13 wells exhibiting measurable thicknesses of LNAPL to 10 wells exhibiting measurable thicknesses of LNAPL).

LNAPL thicknesses measured in April 2004 were generally consistent with thicknesses measured in previous months.

DNAPL

Measurable DNAPL was recorded in nine wells during the reporting period. The measured DNAPL thicknesses ranged from 0.31 feet in EW-9s to 10.78 feet in MW-20i.

Five wells in the FWDA and four wells in the TFA contained DNAPL during this reporting period (Table 3). This is a decrease in distribution from the previous reporting period (from 10 wells exhibiting measurable thicknesses of DNAPL to 9 wells exhibiting measurable thicknesses of DNAPL).

No significant difference in overall DNAPL thickness measurements was observed from March 2004 to April 2004. However, DNAPL thickness decreased in EW-15s from 9.09 feet to not present, while DNAPL thickness increased from 7.02 feet to a maximum of 10.78 feet in MW-20i.

The re-appearance of DNAPL may be attributable to the barrier wall construction activities, which involved operation of heavy equipment and subsurface vibrations along the barrier wall to a depth of 80 feet below ground surface. The resultant ground pressures and vibrations may have increased the ability of DNAPL to permeate site soils and enter nearby wells. In addition, the increased water-level elevations within the barrier wall may have remobilized some DNAPL (and LNAPL) previously retained in vadose soils. During "normal" site conditions, the high dynamic viscosity of DNAPL, combined with molecular attraction of the DNAPL fluid to soil particles, likely creates substantial resistance to the flow of DNAPL into wells. E & E will continue to carefully monitor the DNAPL levels in site wells to determine whether the recent DNAPL mobilization will continue, or whether the DNAPL thickness in the wells will gradually diminish.

NAPL Extraction

A total of 28.7 gallons of LNAPL was manually extracted during the reporting period using disposable bailers. This is a slight increase from the previous reporting period, when 23 gallons were removed.

A total of 97.85 gallons of DNAPL was extracted using pneumatic pumps during the reporting period. This is a substantial increase over the previous reporting period. The increase is likely due to further efficiency in DNAPL extraction, and more frequent extraction events (weekly).

Table 3 lists the NAPL thickness recorded at the site and the amount of NAPL extracted during the reporting period. In addition to the wells listed in Table 3, trace amounts of NAPL were observed on the water-level probe in monitoring wells EW-25s and MW-10s during this reporting period. At this time, no information is available on whether the NAPL was LNAPL or DNAPL. E&E will continue to monitor these wells to confirm the presence or absence of NAPL.

3.2 Seep Visual Inspection and Monitoring

Visual inspections of seep areas were conducted bi-weekly during the reporting period, including the existing seep areas in Willamette Cove and along the shoreline in front of the FWDA and TFA. During the bi-weekly visual inspections, the entire riverfront was checked for the presence of new seep areas, sheen observed on the surface water, and any other observations. Water levels have been getting lower and sheen was observed in the TFA during the site walks for this reporting period. No additional seep areas or sheen were observed in Willamette Cove or along the riverfront portion of the site.

4.0 Summary Observations

Shallow aquifer water levels on the inside of the wall located in the TFA are typically higher than shallow water levels on the inside of the wall located in the FWDA. Flow is generally from the TFA to the FWDA. This is consistent with previous monitoring periods. However, water levels within the barrier wall appear to be stabilizing and even showing signs of decreasing. This is likely attributed to the decrease in precipitation over the past several months.

Water levels will continue to be monitored and reported on a monthly basis. E&E is currently preparing a site groundwater flow model, which will be used as a tool for evaluating how local precipitation and Willamette River stage effect water levels within the barrier wall. The model will take into account such things as site geology, well screen intervals, horizontal and vertical flow, tidal effects, water budgets, and wall leakage.

NAPL monitoring and extraction will continue on a weekly basis, and patterns of NAPL appearance and rebound will be noted and used to optimize removal activities. Observed NAPL thicknesses and occurrence during the reporting period were fairly consistent with the previous reporting period, although a slight decrease was observed in the number of wells containing LNAPL. NAPL extraction volumes, in particular DNAPL, increased from the previous reporting period. This is likely due to increased frequency in NAPL monitoring and extraction.

Table 1
Monitoring Well Network
McCormick and Baxter Creosoting Company Site
Portland, Oregon

Well Identification	Monitoring Frequency	Measurement Method	Screen Interval (feet NGVD)
Existing Wells			
EW-1s	Weekly	Manual/NAPL Gauge	17.89 to -7.11
EW-2s	Weekly	Manual/NAPL Gauge	18.48 to -6.52
EW-4s	Weekly	Manual/NAPL Gauge	4.82 to -5.18
EW-5s	Weekly	Manual/NAPL Gauge	7.97 to -2.03
EW-7s	Weekly	Manual/NAPL Gauge	7.83 to -2.17
EW-8s	Weekly	Manual/NAPL Gauge	3.94 to -16.06
EW-9s	Weekly	Manual/NAPL Gauge	2.64 to -7.36
EW-10s	Weekly	Manual/NAPL Gauge	9.64 to -10.37
EW-12s	Weekly	Manual/NAPL Gauge	17.41 to -2.59
EW-14R	Weekly	Manual/NAPL Gauge	21.37 to 1.37
EW-15s	Weekly	Manual/NAPL Gauge	12.35 to -7.65
EW-16R	Weekly	Manual/NAPL Gauge	14.15 to -5.85
EW-17s	Weekly	Manual/NAPL Gauge	15.31 to -4.69
EW-18s	Weekly	Manual/NAPL Gauge	14.53 to -5.47
EW-19s	Weekly	Manual/NAPL Gauge	*9.64 to -9.5*
EW-20s	Weekly	Manual/NAPL Gauge	
EW-22s	Weekly	Manual/NAPL Gauge	18.49 to -1.51
EW-23s	Weekly	Manual/NAPL Gauge	17.21 to -2.79
EW-24s	Weekly	Manual/NAPL Gauge	17.53 to -2.47
EW-25s	Bi-Monthly	Manual/Water level indicator	22.78 to 2.78
MW-2s	Bi-Monthly	Manual/Water level indicator	18.72 to -1.28
MW-10s	Bi-Monthly	Manual/Water level indicator	16.96 to -3.04
MW-11s	Bi-Monthly	Manual/Water level indicator	17.96 tp -2.04
MW-14s	Bi-Monthly	Manual/Water level indicator	16.13 to -3.87
MW-15s	Bi-Monthly	Manual/Water level indicator	24.38 to 4.38
MW-17s	Bi-Monthly	Manual/Water level indicator	19.68 to -0.32
MW-18s	Bi-Monthly	Manual/Water level indicator	15.57 to -4.43
MW-20i	Weekly	Manual/NAPL Gauge	-16.05 to -36.05
MW-33s	Bi-Monthly	Manual/Water level indicator	16.64 to 6.64
MW-34i	Weekly	Manual/NAPL Gauge	-34.27 to -54.27
MW-36d	Hourly	Pressure Transducer	-57.69 to -62.69
MW-36i	Hourly	Pressure Transducer	-17.41 to -22.41
MW-36s	Hourly	Pressure Transducer	11.57 to 1.57
MW-37d	Hourly	Pressure Transducer	-62.72 to -67.72
MW-37i	Hourly	Pressure Transducer	-22.49 to -27.49
MW-37s	Hourly	Pressure Transducer	5.75 to -4.25
MW-38s	Bi-Monthly	Manual/Water level indicator	11.06 to 1.06
MW-39s	Bi-Monthly	Manual/Water level indicator	10.02 to 0.02
MW-40d	Hourly	Pressure Transducer	-56.92 to -61.92
MW-40i	Hourly	Pressure Transducer	-16.76 to -21.76
MW-40s	Hourly	Pressure Transducer	11.40 to 1.40
MW-41d	Hourly	Pressure Transducer	-57.95 to -62.95
MW-41i	Hourly	Pressure Transducer	-17.96 to -22.96
MW-41s	Hourly	Pressure Transducer	10.26 to 0.26
MW-42s	Bi-Monthly	Manual/Water level indicator	23.02 to 13.02
MW-43s	Bi-Monthly	Manual/Water level indicator	21.95 to 11.95
MW-44d	Hourly	Pressure Transducer	-57.09 to -62.06
MW-44i	Hourly	Pressure Transducer	-16.81 to -21.81
MW-44s	Hourly	Pressure Transducer	11.11 to 1.11
MW-45d	Hourly	Pressure Transducer	-58.07 to -63.07
MW-45i	Hourly	Pressure Transducer	-17.93 to -22.93
MW-45s	Hourly	Pressure Transducer	10.43 to 0.43
MW-46s	Bi-Monthly	Manual/Water level indicator	22.20 to 12.20

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Table 1
Monitoring Well Network
McCormick and Baxter Creosoting Company Site
Portland, Oregon

Well Identification	Monitoring Frequency	Measurement Method	Screen Interval (feet NGVD)
MW-47s	Bi-Monthly	Manual/Water level indicator	22.74 to 12.74
MW-48s	Bi-Monthly	Manual/Water level indicator	21.02 to 11.02
MW-49s	Bi-Monthly	Manual/Water level indicator	20.19 to 10.19
MW-50s	Hourly	Pressure Transducer	22.26 to 12.26
MW-51s	Hourly	Pressure Transducer	22.88 to 12.88
MW-52s	Bi-Monthly	Manual/Water level indicator	23.09 to 13.09
MW-53s	Bi-Monthly	Manual/Water level indicator	23.12 to 13.12
MW-54s	Hourly	Pressure Transducer	23.85 to 13.85
MW-55s	Hourly	Pressure Transducer	23.57 to 13.57
MW-56s	Weekly	Manual/NAPL Gauge	24.42 to 14.42
MW-57s	Bi-Monthly	Manual/Water level indicator	24.36 to 14.36
MW-58d	Hourly	Pressure Transducer	-42.02 to -47.02
MW-58s	Hourly	Pressure Transducer	26.06 to 16.06
MW-5s	Bi-Monthly	Manual/Water level indicator	23.07 to 3.07
MW-7s	Bi-Monthly	Manual/Water level indicator	16.20 to -3.80
MW-7-WC	Bi-Monthly	Manual/Water level indicator	
MW-As	Bi-Monthly	Manual/Water level indicator	12.80 to 7.80
MW-Bs	Bi-Monthly	Manual/Water level indicator	12.48 to 7.48
MW-Cs	Bi-Monthly	Manual/Water level indicator	16.04 to 11.04
MW-Ds	Weekly	Manual/NAPL Gauge	5.41 to 0.41
MW-Es	Weekly	Manual/NAPL Gauge	17.18 to -2.83
MW-Gs	Weekly	Manual/NAPL Gauge	13.73 to -6.27
MW-Is	Bi-Monthly	Manual/Water level indicator	18.39 to -1.61
MW-Ks	Bi-Monthly	Manual/Water level indicator	20.54 to 0.54
MW-LRs	Bi-Monthly	Manual/Water level indicator	17.83 to -2.07
MW-Ni	Weekly	Manual/NAPL Gauge	-22.53 to -33.53
MW-Os	Bi-Monthly	Manual/Water level indicator	15.39 to -4.62
MW-Ps	Bi-Monthly	Manual/Water level indicator	2.94 to -7.06
MW-Rs	Weekly	Manual/NAPL Gauge	16.66 to 1.66

Note: *italic* text = approximate value

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Table 2
VERTICAL GROUNDWATER ELEVATION GRADIENTS
April 26, 2004
McCORMICK & BAXTER CREOSOTING COMPANY
PORTLAND, OREGON

Well ID	High Tide (1207) Mid-point value	Direction	Low Tide (2207) Mid-point value	Direction
MW-36s to MW-36d	0.0709	down	0.08995	down
MW-36s to MW-36i	0.1582	down	0.20740	down
MW-36i to MW-36d	0.002625	down	0.00175	up
MW-37s to MW-37d	0.001071	up	0.00612	down
MW-37s to MW-37i	0.004333	up	0.02061	down
MW-37i to MW-37d	0.0008515	down	0.00227	up
MW-40s to MW-40d	0.09467	down	0.11040	down
MW-40s to MW-40i	0.2143	down	0.25510	down
MW-40i to MW-40d	0.0008782	down	0.00293	up
MW-41s to MW-41d	0.006007	up	0.01273	down
MW-41s to MW-41i	0.002472	up	0.03731	down
MW-41i to MW-41d	0.008532	up	0.00471	up
MW-44s to MW-44d	0.1185	down	0.13790	down
MW-44s to MW-44i	0.2632	down	0.29980	down
MW-44i to MW-44d	0.006236	down	0.012470	down
MW-45s to MW-45d	0.003251	up	0.01457	down
MW-45s to MW-45i	0.000858	up	0.03106	down
MW-45i to MW-45d	0.004838	up	0.0036990	down

Note: Gradients calculated using EPA vertical gradient calculator.
http://www.epa.gov/athens/learn2model/part-two/onsite/vgradient02.htm

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Table 3 LNAPL and DNAPL Measurement and Extraction Summary April 1 through April 30, 2004 McCormcik and Baxter Creosoting Company Site Portland, Oregon			
Date Measured	**Well Number**	**Thickness (feet)**	**Extracted (Gallons)**
LNAPL			
4/5/03	EW-18s	0.25	0 gallons
4/5/03	MW-Is	0.03	0 gallons
4/5/04	EW-1s	0.10	0 gallons
4/5/04	EW-23s	1.49	1 gallon
4/5/04	MW-56s	0.20	0 gallons
4/5/04	MW-Es	1.12	0.4 gallons
4/5/04	MW-Gs	0.05	0 gallons
4/6/04	EW-10s	0.77	0.6 gallons
4/6/04	EW-15s	5.22	3.5 gallons
4/19/04	MW-Is	0.12	0 gallons
4/19/04	EW-15s	3.55	4.5 gallons
4/19/04	MW-Rs	0.26	0 gallons
4/20/04	EW-18s	0.59	1.2 gallons
4/20/04	MW-56s	0.13	0 gallons
4/20/04	MW-Es	0.99	1 gallon
4/21/04	MW-Gs	0.11	0 gallons
4/21/04	EW-10s	1.11	1.5 gallons
4/21/04	EW-23s	1.27	2 gallons
4/26/04	EW-18s	0.49	1.5 gallons
4/26/04	MW-Es	1.25	0.75 gallons
4/28/04	MW-56s	0.58	0.75 gallons
4/28/04	MW-Rs	0.54	1.0 gallons
4/29/04	EW-10s	1.93	2 gallons
4/29/04	EW-15s	5.03	4.5 gallons
4/29/04	EW-23s	1.66	2 gallons
4/29/04	MW-Gs	0.47	0.5 gallons
DNAPL			
4/5/04	EW-9s	2.33	4.5 gallons
4/5/03	EW-8s	2.12	4.1 gallons
4/5/04	MW-20i	10.78	9.75 gallons
4/5/04	MW-Ds	3.60	3.5 gallons
4/5/04	MW-Gs	1.39	1.2 gallons
4/5/04	MW-Is	4.48	1.75 gallons
4/5/04	EW-1s	3.71	10 gallons
4/5/04	MW-Es	0.35	0 gallons
4/19/04	EW-1s	2.60	6.5 gallons
4/19/04	MW-Is	2.92	2.25 gallons
4/19/04	EW-8s	2.31	4.3 gallons
4/20/04	EW-9s	0.31	0 gallons
4/20/04	MW-Ds	3.17	2 gallons
4/20/04	MW-Es	0.41	0 gallons
4/21/04	MW-Gs	2.13	2.5 gallons
4/21/04	MW-20i	6.70	6 gallons
4/21/04	EW-24s	1.45	2.5 gallons
4/26/04	EW-1s	2.79	10 gallons
4/28/04	EW-8s	2.30	5 gallons
4/28/04	MW-Is	3.23	5 gallons
4/29/04	EW-24s	1.50	2.5 gallons
4/29/04	MW-20i	6.56	10 gallons
4/29/04	MW-Ds	3.69	2.5 gallons
4/29/04	MW-Gs	1.39	2 gallons

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Table 4

GROUNDWATER ELEVATION GRADIENTS
McCORMICK & BAXTER CREOSOTING COMPANY
PORTLAND, OREGON

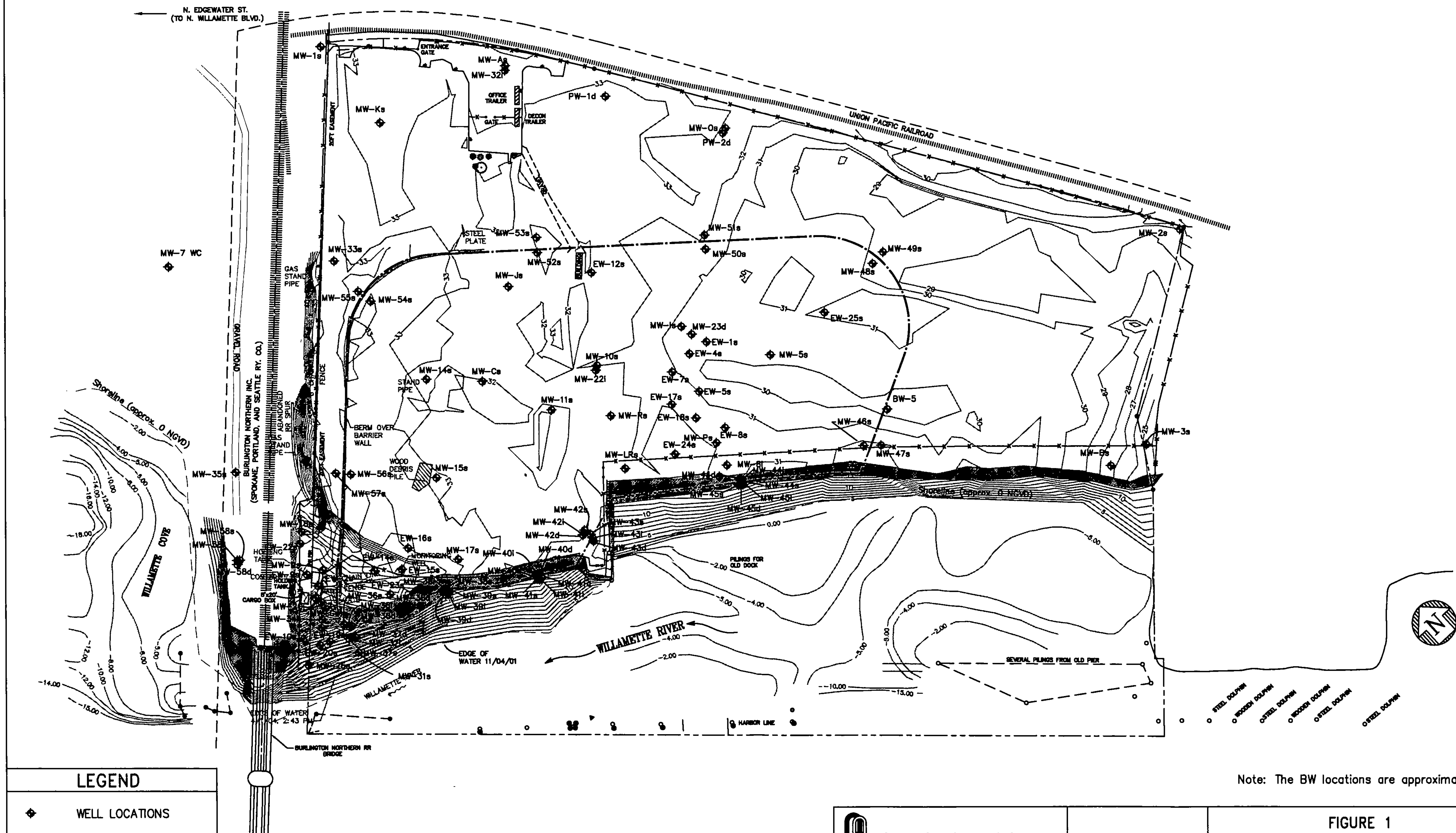
TFA Monitoring Wells

Date	MW-49s Groundwater Elevation (ft, MSL)	MW-47s Groundwater Elevation (ft, MSL)	Horizontal Distance (ft)	Angle of Flowpath Deviation (degrees)	Horizontal Gradient (ft/ft)	Horizontal Gradient (ft/mile)
Apr-04	14.46	5.62	387.5	40	0.030	157
Mar-04	15.20	5.61	387.5	38	0.031	166

FWDA Monitoring Wells

Date	MW-50s Groundwater Elevation (ft, MSL)	MW-36s Groundwater Elevation (ft, MSL)	Horizontal Distance (ft)	Angle of Flowpath Deviation (degrees)	Horizontal Gradient (ft/ft)	Horizontal Gradient (ft/mile)
Apr-04	14.00	10.07	1,090.40	9	0.004	19
Mar-04	14.53	10.41	1,090.40	11	0.004	20

Key:
ft = Feet.
ft/ft = Feet per foot.
ft/mile = Feet per mile.
FWDA = Former waste disposal area.
MSL = Mean sea level.
TFA = Tank farm area.



Note: The BW locations are approximate.

LEGEND

◆	WELL LOCATIONS
⊕	BORE HOLE
ⅡⅡⅡⅡⅡ	RAILROAD TRACKS
-------	PROPERTY LINE
—·—·—	BARRIER WALL

BRG PLOTTED: 05-06-04

SCALE IN FEET
0 100 200 300

NO.	DATE	DWN	APP'D	DESCRIPTION

REVISIONS

APPROVED BY

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Portland, Oregon

DESIGNED BY: C. NANCARROW

CHECKED BY:

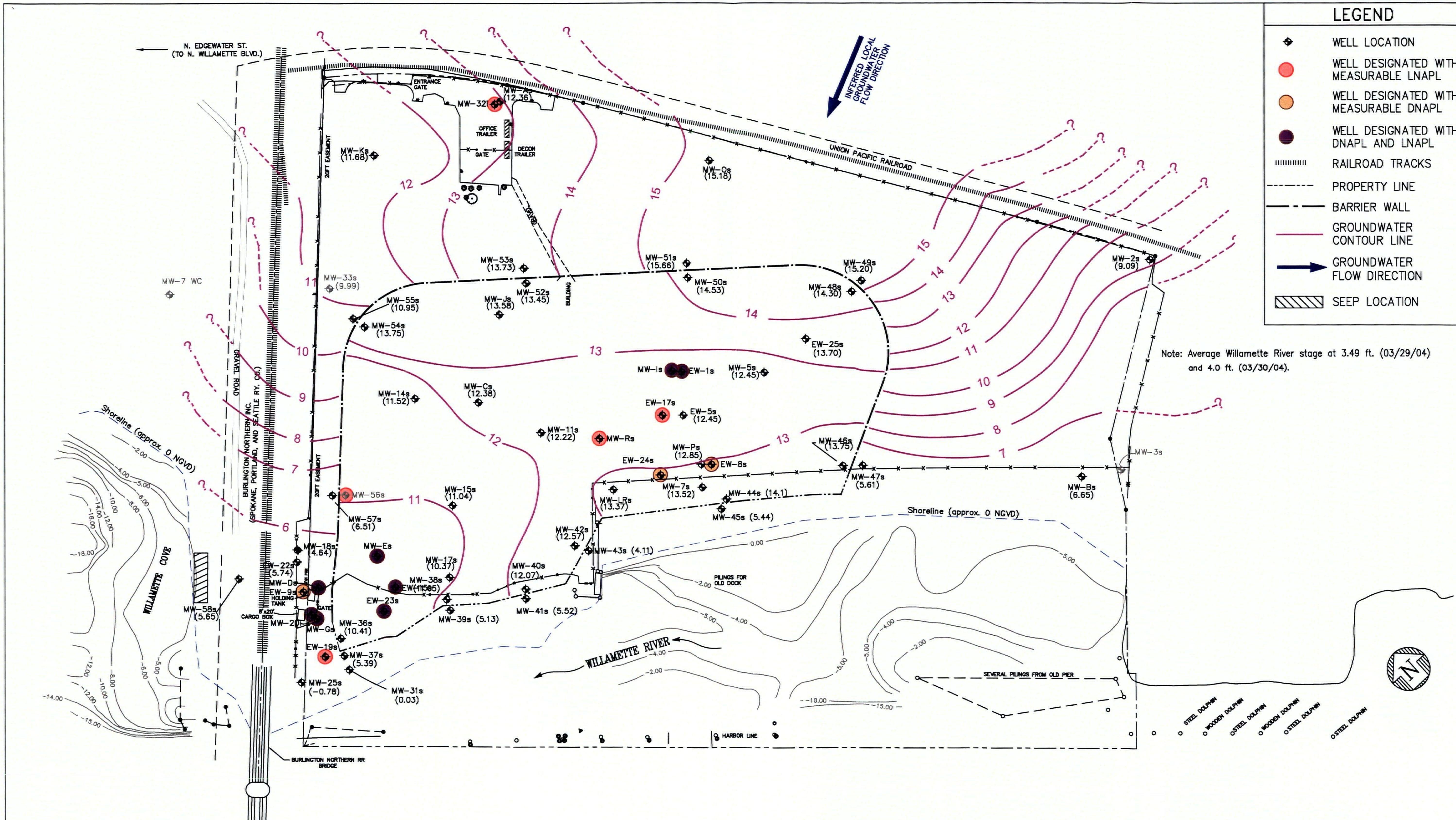
DRAWN BY: E. YAO

FIGURE 1

MONITORING WELL LOCATIONS

McCORMICK AND BAXTER CREOSOTING COMPANY

SCALE	DATE ISSUED	C.A.D. FILE NO.	FIGURE NO.
NOTED	05-06-04	figure1.dwg	1



NO.	DATE	DWN	APP'D	DESCRIPTION

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DESIGNED BY: J. SPIEGEL

CHECKED BY: E. LYNCH

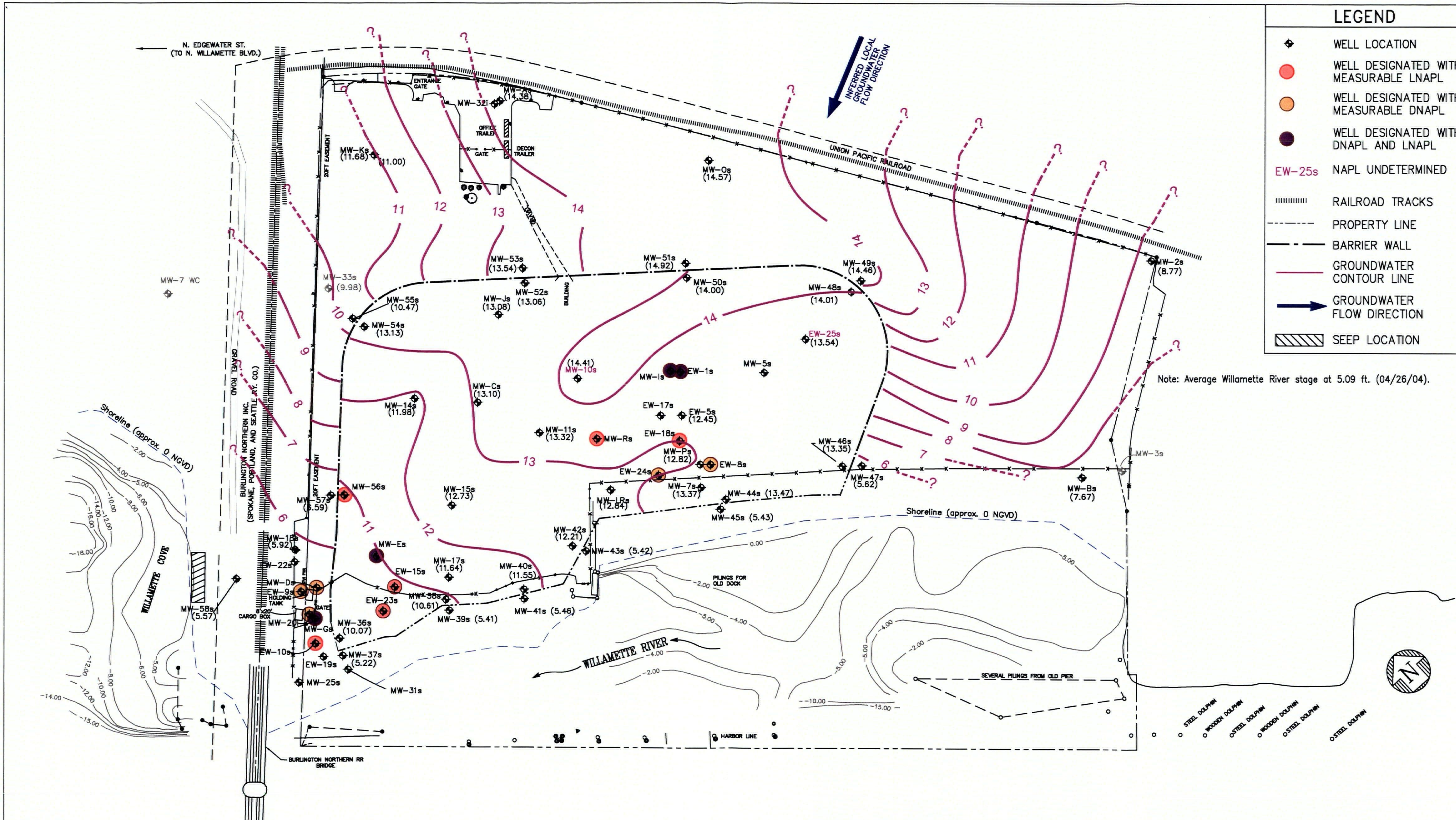
DRAWN BY: E. YAO

FIGURE 2

SHALLOW GROUNDWATER ELEVATION CONTOUR MAP
MARCH 29 and 30, 2004
McCORMICK AND BAXTER CREOSOTING COMPANY

SCALE	DATE ISSUED	C.A.D. FILE NO.	FIGURE NO.
NOTED	05-05-04	MBGW02_2.dwg	1

BRG PLOTTED: 05-05-04



BRG PLOTTED: 05-10-04

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CHECKED BY: E. LYNCH

DRAWN BY: E. YAO

APPROVED BY

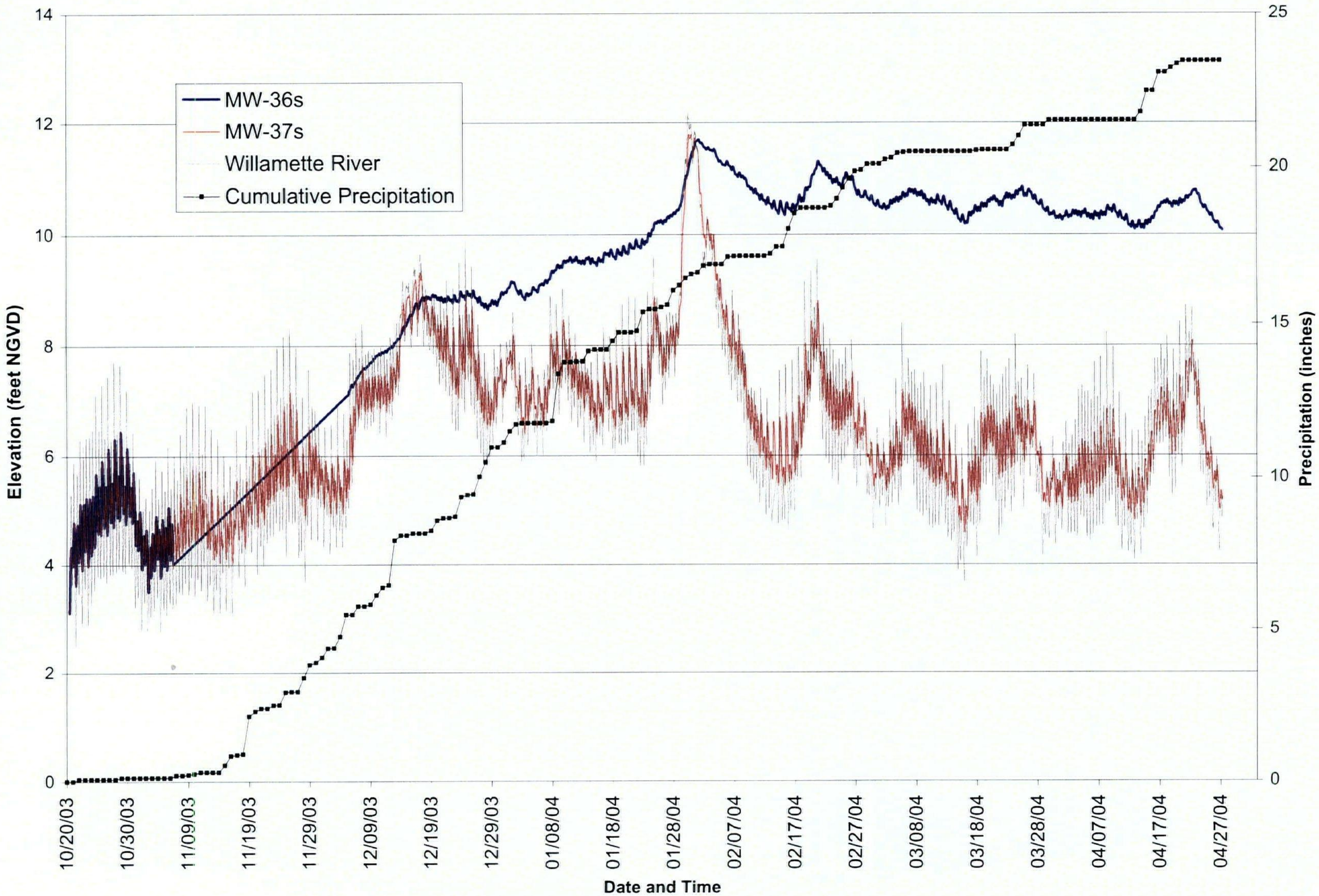
NO.	DATE	DRN	APP'D	DESCRIPTION

REVISIONS

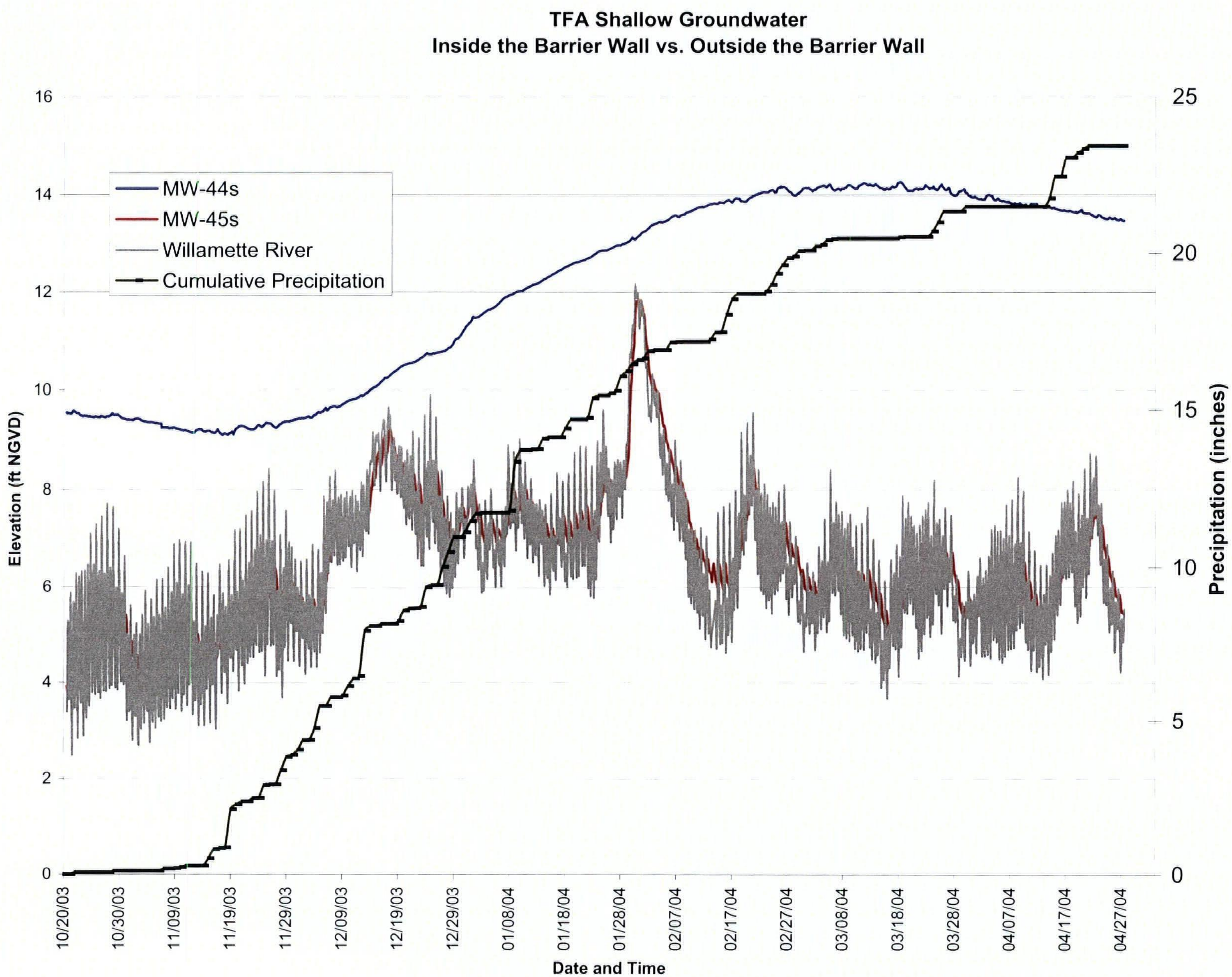
Figure 3
Monitoring Wells With NAPL Present April 2004
and
Groundwater Contours April 27, 2004
McCORMICK AND BAXTER CREOSOTING COMPANY

SCALE	DATE ISSUED	C.A.D. FILE NO.	FIGURE NO.
NOTED	05-10-04	figure3.dwg	1

FWDA Shallow Groundwater
Inside the Barrier Wall vs Outside the Barrier Wall



*Note: Rain gage is located on Swan Island. Data presented in this graph is obtained from the City of Portland HYDRA Rainfall Network at http://oregon.usgs.gov/non-usgs/bes/



TFA Shallow Groundwater
Inside the Barrier Wall vs. Outside the Barrier Wall
MW-44s
MW-45s
Willamette River
Cumulative Precipitation
Elevation (ft NGVD)
Precipitation (inches)
Date and Time
0
2
4
6
8
10
12
14
16
0
5
10
15
20
25
10/20/03
10/30/03
11/09/03
11/19/03
11/29/03
12/09/03
12/19/03
12/29/03
01/08/04
01/18/04
01/28/04
02/07/04
02/17/04
02/27/04
03/08/04
03/18/04
03/28/04
04/07/04
04/17/04
04/27/04